Space Weather Forecast

Issued on Tuesday, 25 January 2022 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance G1 Minor Geomagnetic Storm, mainly day 1 and 4 (25th and 28th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the past 24 hours, with only a couple of Common-class flares, the strongest of which was from a region that isn't currently visible. There are four other sunspot regions visible, but these are all small and magnetically simple, although with some development being observed in a couple of them. The northern hemisphere centre disc produced a background flare overnight that resulted in a coronal mass ejection (CME) being observed. This CME however was analysed as passing above and over the north pole and missing us.

Solar Wind / Geomagnetic Activity: The solar wind increased a little from background levels since 25/0400 UTC, to reach 380km/s. The magnetic field showed two distinct features. The first, was where it remained fairly smooth, becoming moderate in strength overall, but persistently pointed southward in the north-south component, although weakly. This may have been the glancing influence of a weak CME. The magnetic field then became more turbulent with greater variations between the north and south pointed field while the speed increased. This was likely due to Earth moving through the region that builds up ahead of faster solar winds before moving into the faster winds. Geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low to Very Low, with four sunspot containing active regions on the visible disc, and further region or regions likely to rotate onto it.

Solar Wind / Geomagnetic Activity: Current enhancement to the solar wind is expected to continue day 1 (25th) and into day 2 (26th), before very gradually easing. Although there is the potential for a weak glancing impact during this period from a CME from a filament eruption on 22/0630UTC. The next notable enhancement will be from the arrival of the fast wind of another coronal hole, most likely day 4 (28th) with the potential for another weak CME to glance across Earth towards midnight. This is currently considered more likely to miss, however, with only a slight chance of impact. Quiet to Active conditions at first day 1 (25th) and early day 2 (26th), will include the chance of isolated G1/Minor Storm intervals. Activity is then expected to be Quiet with Unsettled intervals, before increasing again to Unsettled to Active with a chance of G1/Minor Storm intervals with any fast wind arrival or CME influence on day 4 (28th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	1	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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